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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/818,575	03/28/2001	Zvi Yona	P-3068-US	3666

7590 05/13/2003  
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EXAMINER

CHANG, AUDREY Y

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 05/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/818,575

Applicant(s)

YONA ET AL.

Examiner

Audrey Y. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on *March 10, 2003* has been entered.
2. This Office Action is also in response to applicant's amendment filed on March 10, 2003, which has been entered as paper number 13.
3. By this amendment, the applicant has amended claims 1, 10 and 19.
4. Claims 1-23 remain pending in this application.

### *Claim Rejections - 35 USC § 112*

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. **Claims 6, 7, 9, 15, 16 and 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.** The claim(s) contains subject matter which was not described in the specification in such a way as to **enable** one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification and the claims fail to teach how could the redirecting unit being a polarized reflective device that is capable of "directing at least said first and second image fraction to at least first and second respective spatial region of a reflecting unit". Clarifications are required. It is known in the

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art that a polarized reflective device to the most can only reflect light with one particular polarization state; it will not be able to *redirect* light into different direction.

The specification and claims also fail to teach how could an image source is capable of generation spatial image fractions that are of different wavelength or of different polarization. Certain essential elements are needed to achieve such features.

### *Claim Objections*

7. Claims 1-23 are objected to because of the following informalities:

(1) The phrase “a signification portion” recited in claims 1, 10 and 19 is indefinite since it is not clear in what exact degree is the portion considered to be “significant”.

(2) The phrase “substantially spatially continuous image” recited in claims 1, 10 and 19 is indefinite since it is not clear what is considered to be “substantially continuous” here.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. **Claims 1-6, 10-15, and 19-23 re rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Morishima et al (PN.5, 589,956).**

Morishima et al teaches an image display apparatus that is comprised of a plurality of image display elements (1-1, 1-2 of Figure 10) together serve as *an image source* for generating at least a first and second *partial image* (14-1 and 14-2) that serve as the *first and second spatial image fractions*

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wherein the two spatial image fraction having significant portions that are not overlapping to each other. The image display apparatus further comprises a holographic optical element (HOE 2a, Figure 10) that serve as the *redirecting unit* that is coupled to the image source to direct the at least first and second spatial image fractions to *a first and second spatial region*, respectively, of a *reflective* holographic optical element (HOE 2b), serves as the reflecting unit, whereby the first and second spatial image fractions are formed and viewed by an observer as an *integrated, continuous single image*, (please see Figures 10-11, column 2 lines 50-65, and column 9, line 27 to column 10).

This reference has met all the limitations of the claims with the exception that it does not teach *explicitly* to use a relay optics, however as demonstrated by Figure 10, Morishima et al teaches that each of the image fraction is directed to specific location of the redirecting unit (HOE2a) which implicitly suggests certain kind of the relay optics with associated field of view is used to direct the image fractions. It also would have been obvious to one skilled in the art to utilize a relay optics having associated field of view with the image fraction, if such is not the case in the cited reference, to allow the image fractions be directed to the proper locations of the redirecting unit which further be directed to the proper spatial location of the reflecting unit for the benefit of providing more accurate high resolution image display of the composite image.

With regard to claims 2-4, 11-13, and 20-23, Morishima et al teaches that the reflecting unit is a holographic optical element (HOE2b, Figure 10) which is a diffractive optics having optic power for converging the image fractions to form the composite or integrated image. Although this reference does not teach explicitly that the holographic optical element is a binary optics such feature is either inherently met by the disclosure or an obvious modification to one skilled in the art for the benefit of providing an alternatively well known type of diffractive element that have good diffraction efficiency. Morishima et al teaches that the image display apparatus could be applied as head mount display, which implicitly requires the observer being capable of viewing the surrounding scene also. Although this reference does

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not teach explicitly to make the power of the holographic optical element to have zero optical power for surrounding scene by providing a corrector hologram, however such practice is standard in the art for the benefit stated above, such modification would therefore have been obvious to one skilled in the art.

With regard to claims 6 and 15, although this reference does not teach explicitly that the image fractions are of different wavelength however such modification is rather obvious by simply using color filter to make the image fractions with different color code. Such modification would therefore have been obvious to one skilled in the art to provide different color design to the integrated and composite image.

**10. Claims 1, 7, 9, 10, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Iba et al (PN. 5,982,343).**

Iba et al teaches a *visual display apparatus* that is comprised of two-dimensional image display devices (12 and 13, Figure 30), that together serve as the image source, for generating a first and second image fraction (11 and 10), which do not have significant overlapping with each other. The two image fractions are *polarization coded*, (please see column 20, lines 33-35). The visual display apparatus further comprises a *half-mirror (15) with quarter wave plate (21)* that serve as the *polarization reflecting device* for redirecting the image fractions to a first and second spatial locations of a *half mirror (60)*, serves as the *reflecting unit* to form an integrated composite image (9), (please see Figure 30, column 20). This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the visual display apparatus comprises a relay optics. However Iba et al teaches that the image fractions are directed to specific locations of the redirecting unit and reflecting unit for forming the composite image which implicitly suggests that the a relay optics is used for relaying the image fractions to the desired locations. It would also have been obvious to one skilled in the art to use relay optics, if this is not the case of the instant application, for the benefit of accurately relaying the image fractions to the desired locations to enhance the quality of the display apparatus.

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11. Claims 1, 8, 10 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Florence et al (PN. 5,652,666).

Florence et al teaches a *holographic display system* that is comprised of a *spatial light modulator* (14, Figure 4), for generating a plurality of stripes of image representing a hologram, that serves as the *at least first and second image fractions*, with no significant portions being overlapped with each of the stripe of images, (please see Figure 4). The display system further comprises a set of lenses (41-43) serves as the relay optics with associated field of view for directing the image fractions to a scanning mirror (45) that is rotatable for redirecting the stripes of image to a cylindrical lens (44) to form an integrated hologram image at an image plane (46). This reference has met all the limitations of the claims with the exception that it does not teach explicitly to use a reflecting unit as the means for forming the integrated image. However to use a transparent lens or a reflective mirror for converging image light to form image is rather well known in the art such modification would have been obvious to one skilled in the art for the benefit of providing a different and more compact optical design to the display system.

#### *Response to Arguments*

12. Applicant's arguments with respect to claims 1-23 have been considered but are moot in view of the new ground(s) of rejection.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

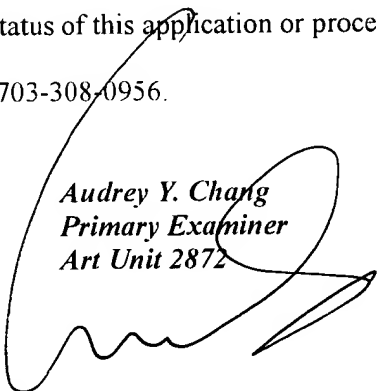
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization where

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this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

*Audrey Y. Chang*  
*Primary Examiner*  
*Art Unit 2872*



A. Chang, Ph.D.  
May 9, 2003